

Concrete Masonry Walls: The nominal R-values in Table 10-5B may be used for purposes of calculating concrete masonry wall section U-factors in lieu of the ASHRAE isothermal planes calculation method as provided in Chapter 25 of Standard RS-1.

TABLE 10-5B(1)
GROUP R OCCUPANCY: DEFAULT U-FACTORS FOR CONCRETE AND MASONRY WALLS

8" Concrete Masonry

WALL DESCRIPTION	CORE TREATMENT			
	Partial Grout with UngROUTED Cores			Solid Grout
	Empty	Loose-fill insulated		
Perlite		Vermiculite		
Exposed Block, Both Sides	0.40	0.23	0.24	0.43
R-5 Interior Insulation, Wood Furring	0.14	0.11	0.12	0.15
R-6 Interior Insulation, Wood Furring	0.14	0.11	0.11	0.14
R-10.5 Interior Insulation, Wood Furring	0.11	0.09	0.09	0.11
R-8 Interior Insulation, Metal Clips	0.11	0.09	0.09	0.11
R-6 Exterior Insulation	0.12	0.10	0.10	0.12
R-10 Exterior Insulation	0.08	0.07	0.07	0.08
R-9.5 Rigid Polystyrene Integral Insulation, Two Webbed Block	0.11	0.09	0.09	0.12

12" Concrete Masonry

WALL DESCRIPTION	CORE TREATMENT			
	Partial Grout with UngROUTED Cores			Solid Grout
	Empty	Loose-fill insulated		
Perlite		Vermiculite		
Exposed Block, Both Sides	0.35	0.17	0.18	0.33
R-5 Interior Insulation, Wood Furring	0.14	0.10	0.10	0.13
R-6 Interior Insulation, Wood Furring	0.13	0.09	0.10	0.13
R-10.5 Interior Insulation, Wood Furring	0.11	0.08	0.08	0.10
R-8 Interior Insulation, Metal Clips	0.10	0.08	0.08	0.09
R-6 Exterior Insulation	0.11	0.09	0.09	0.11
R-10 Exterior Insulation	0.08	0.06	0.06	0.08
R-9.5 Rigid Polystyrene Integral Insulation, Two Webbed Block	0.11	0.08	0.09	0.12

8" Clay Brick

WALL DESCRIPTION	CORE TREATMENT			
	Partial Grout with UngROUTED Cores			Solid Grout
	Empty	Loose-fill insulated		
Perlite		Vermiculite		
Exposed Block, Both Sides	0.50	0.31	0.32	0.56
R-5 Interior Insulation, Wood Furring	0.15	0.13	0.13	0.16
R-6 Interior Insulation, Wood Furring	0.15	0.12	0.12	0.15
R-10.5 Interior Insulation, Wood Furring	0.12	0.10	0.10	0.12
R-8 Interior Insulation, Metal Clips	0.11	0.10	0.10	0.11
R-6 Exterior Insulation	0.12	0.11	0.11	0.13
R-10 Exterior Insulation	0.08	0.08	0.08	0.09

6" Concrete Poured or Precast

WALL DESCRIPTION	CORE TREATMENT			
	Partial Grout with UngROUTED Cores			SOLID GROUT
	Empty	Loose-fill insulated		
		Perlite	Vermiculite	
Exposed Concrete, Both Sides	NA	NA	NA	0.61
R-5 Interior Insulation, Wood Furring	NA	NA	NA	0.16
R-6 Interior Insulation, Wood Furring	NA	NA	NA	0.15
R-10.5 Interior Insulation, Wood Furring	NA	NA	NA	0.12
R-8 Interior Insulation, Metal Clips	NA	NA	NA	0.12
R-6 Exterior Insulation	NA	NA	NA	0.13
R-10 Exterior Insulation	NA	NA	NA	0.09

Notes for Default Table 10-5B(1)

1. Grouted cores at 40" x 48" on center vertically and horizontally in partial grouted walls.
2. Interior insulation values include 1/2" gypsum board on the inner surface.
3. Furring and stud spacing is 16" on center. Insulation is assumed to fill furring space and is not compressed.
4. Intermediate values may be interpolated using this table. Values not contained in this table may be computed using the procedures listed in Standard RS-1.

TABLE 10-5B(2)
OTHER THAN GROUP R OCCUPANCY:
DEFAULT U-FACTORS FOR CONCRETE AND MASONRY WALLS

<u>Framing Type and Depth</u>	<u>Rated R-Value of Insulation Alone</u>	<u>Assembly U-Factors for Solid Concrete Walls</u>	<u>Assembly U-Factors for Concrete Block Walls: Solid Grouted</u>	<u>Assembly U-Factors for Concrete Block Walls: Partially Grouted (Cores uninsulated except where specified)</u>
<u>No Framing</u>	<u>R- 0</u>	<u>U- 0.740</u>	<u>U- 0.580</u>	<u>U- 0.480</u>
	<u>UngROUTED Cores Filled with Loose-Fill Insulation</u>	<u>N.A.</u>	<u>N.A.</u>	<u>U- 0.350</u>
<u>Continuous Wood Framing</u>				
<u>0.75 in.</u>	<u>R- 3.0</u>	<u>U- 0.247</u>	<u>U- 0.226</u>	<u>U- 0.210</u>
<u>1.5 in.</u>	<u>R- 6.0</u>	<u>U- 0.160</u>	<u>U- 0.151</u>	<u>U- 0.143</u>
<u>2.0 in.</u>	<u>R- 10.0</u>	<u>U- 0.116</u>	<u>U- 0.111</u>	<u>U- 0.107</u>
<u>3.5 in.</u>	<u>R- 11.0</u>	<u>U- 0.094</u>	<u>U- 0.091</u>	<u>U- 0.088</u>
<u>3.5 in.</u>	<u>R- 13.0</u>	<u>U- 0.085</u>	<u>U- 0.083</u>	<u>U- 0.080</u>
<u>3.5 in.</u>	<u>R- 15.0</u>	<u>U- 0.079</u>	<u>U- 0.077</u>	<u>U- 0.075</u>
<u>5.5 in.</u>	<u>R- 19.0</u>	<u>U- 0.060</u>	<u>U- 0.059</u>	<u>U- 0.058</u>
<u>5.5 in.</u>	<u>R- 21.0</u>	<u>U- 0.057</u>	<u>U- 0.055</u>	<u>U- 0.054</u>
<u>Continuous Metal Framing at 24 in. on center horizontally</u>				
<u>0.75 in.</u>	<u>R- 3.0</u>	<u>U- 0.364</u>	<u>U- 0.321</u>	<u>U- 0.288</u>
<u>1.5 in.</u>	<u>R- 6.0</u>	<u>U- 0.274</u>	<u>U- 0.249</u>	<u>U- 0.229</u>
<u>2.0 in.</u>	<u>R- 10.0</u>	<u>U- 0.225</u>	<u>U- 0.207</u>	<u>U- 0.193</u>
<u>3.5- in.</u>	<u>R- 11.0</u>	<u>U- 0.168</u>	<u>U- 0.158</u>	<u>U- 0.149</u>
<u>4.0</u>				
<u>3.5- in.</u>	<u>R- 13.0</u>	<u>U- 0.161</u>	<u>U- 0.152</u>	<u>U- 0.144</u>
<u>4.0</u>				
<u>3.5- in.</u>	<u>R- 15.0</u>	<u>U- 0.155</u>	<u>U- 0.147</u>	<u>U- 0.140</u>
<u>4.0</u>				
<u>5.5- in.</u>	<u>R- 19.0</u>	<u>U- 0.118</u>	<u>U- 0.113</u>	<u>U- 0.109</u>
<u>6.0</u>				
<u>5.5- in.</u>	<u>R- 21.0</u>	<u>U- 0.113</u>	<u>U- 0.109</u>	<u>U- 0.105</u>
<u>6.0</u>				
<u>1 in. Metal Clips at 24 in. on center horizontally and 16 in. vertically</u>				
<u>1.0 in.</u>	<u>R- 3.8</u>	<u>U- 0.210</u>	<u>U- 0.195</u>	<u>U- 0.182</u>
<u>1.0 in.</u>	<u>R- 5.0</u>	<u>U- 0.184</u>	<u>U- 0.172</u>	<u>U- 0.162</u>
<u>1.0 in.</u>	<u>R- 5.6</u>	<u>U- 0.174</u>	<u>U- 0.163</u>	<u>U- 0.154</u>

1.5 in.	R- 5.7	U- 0.160	U- 0.151	U- 0.143
1.5 in.	R- 7.5	U- 0.138	U- 0.131	U- 0.125
1.5 in.	R- 8.4	U- 0.129	U- 0.123	U- 0.118
2.0 in.	R- 7.6	U- 0.129	U- 0.123	U- 0.118
2.0 in.	R- 10.0	U- 0.110	U- 0.106	U- 0.102
2.0 in.	R- 11.2	U- 0.103	U- 0.099	U- 0.096
2.5 in.	R- 9.5	U- 0.109	U- 0.104	U- 0.101
2.5 in.	R- 12.5	U- 0.092	U- 0.089	U- 0.086
2.5 in.	R- 14.0	U- 0.086	U- 0.083	U- 0.080
3.0 in.	R- 11.4	U- 0.094	U- 0.090	U- 0.088
3.0 in.	R- 15.0	U- 0.078	U- 0.076	U- 0.074
3.0 in.	R- 16.8	U- 0.073	U- 0.071	U- 0.069
3.5 in.	R- 13.3	U- 0.082	U- 0.080	U- 0.077
3.5 in.	R- 17.5	U- 0.069	U- 0.067	U- 0.065
3.5 in.	R- 19.6	U- 0.064	U- 0.062	U- 0.061
4.0 in.	R- 15.2	U- 0.073	U- 0.071	U- 0.070
4.0 in.	R- 20.0	U- 0.061	U- 0.060	U- 0.058
4.0 in.	R- 22.4	U- 0.057	U- 0.056	U- 0.054
5.0 in.	R- 28.0	U- 0.046	U- 0.046	U- 0.045
<u>Continuous Insulation Uninterrupted by Framing</u>				
No Framing	R- 3.0	U- 0.230	U- 0.212	U- 0.197
	R- 4.0	U- 0.187	U- 0.175	U- 0.164
	R- 5.0	U- 0.157	U- 0.149	U- 0.141
No Framing	R- 6.0	U- 0.136	U- 0.129	U- 0.124
	R- 7.0	U- 0.120	U- 0.115	U- 0.110
	R- 8.0	U- 0.107	U- 0.103	U- 0.099
	R- 9.0	U- 0.097	U- 0.093	U- 0.090
	R- 10.0	U- 0.088	U- 0.085	U- 0.083
No Framing	R- 11.0	U- 0.081	U- 0.079	U- 0.076
	R- 12.0	U- 0.075	U- 0.073	U- 0.071
	R- 13.0	U- 0.070	U- 0.068	U- 0.066
	R- 14.0	U- 0.065	U- 0.064	U- 0.062
	R- 15.0	U- 0.061	U- 0.060	U- 0.059
No Framing	R- 16.0	U- 0.058	U- 0.056	U- 0.055
	R- 17.0	U- 0.054	U- 0.053	U- 0.052
	R- 18.0	U- 0.052	U- 0.051	U- 0.050
	R- 19.0	U- 0.049	U- 0.048	U- 0.047
	R- 20.0	U- 0.047	U- 0.046	U- 0.045

Notes for Default Table 10-5B(2)

- It is acceptable to use the U-factors in Table 10-5B(2) for all concrete and masonry walls, provided that the grouting is equal to or less than that specified.
 - For ungrouted walls, use the partially-grouted column.
 - For metal studs and z-furring, use the continuous-metal-framing category.
 - For discontinuous metal clips 1 inch square or smaller, use the metal-clip category.
 - For insulation that is attached without any framing members (e.g. glued), use the continuous-insulation-uninterrupted-by-framing category. Continuous insulation may be installed on the interior or exterior of masonry walls, or between stand-alone walls in multi-layer masonry walls, or on the interior or exterior of the concrete.
- For Table 10-5B(2), the U-factor includes R-0.17 for exterior air film and R-0.68 for interior air film - vertical surfaces. For insulated walls, the U-factor also includes R-0.45 for 0.5 in. gypsum board. U-factors are provided for the following configurations:
 - (a) Concrete wall: 8-in. normal weight concrete wall with a density of 145 lb/ft³.
 - (b) Solid grouted concrete block wall: 8-in. medium weight ASTM C90 concrete block with a density of 115 lb/ft³ and solid grouted cores.
 - (c) Partially grouted concrete block wall: 8-in. medium weight ASTM C90 concrete block with a density of 115 lb/ft³ having reinforcing steel every 32 in. vertically and every 48 in. horizontally, with cores grouted in those areas only. Other cores are filled with insulating material only if there is no other insulation.

3. For walls with insulation contained in a framing layer, the U-factors in Table 10-5B(2) assume contact (and thermal bridging) between the mass wall and other framing. For wall assemblies with multiple layers where the wood or metal framing layer does not contact the concrete or masonry layer (i.e. walls with an airspace between the stud wall layer and the mass wall layer), it is acceptable to use the appropriate wood or metal frame wall default U-factors in Tables 10-5 or 10-5A. Note, it is acceptable to use this approach where the insulation extends beyond the framing and is in contact with the mass wall layer (e.g. a nominal four-inch metal stud containing insulation that is nominally six inches thick and therefore extends two inches beyond the back of the metal stud).
4. Except for wall assemblies qualifying for note 3, if not taken from Table 10-5B(2), mass wall U-factors shall be determined in accordance with ASHRAE/IESNA Standard 90.1-2001, Appendix A, Section A3.1 and Tables A-5 to A-8, or Section A9.4. If not taken from Table 10-9, heat capacity for mass walls shall be taken from ASHRAE/IESNA Standard 90.1-2001, Appendix A, Table A-6 or A-7.